

REMARKS

Claims 1 - 15 remain active in this application. The specification has been reviewed and editorial revisions made where seen to be appropriate. Claim 10 has been amended to correct a typographical matter. No substantive amendments have been made. No new matter has been introduced into the application.

Claims 1 - 15 have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. This ground of rejection is respectfully traversed.

It is abundantly evident that the specification as originally filed describes the invention in a manner which would enable those skilled in the art to practice the invention. First of all, the basic form of the preferred Extrinsic Fabry-Perot Interferometer (EFPI) sensor is well-known and well documented in the literature. Nevertheless, a detailed description of its preferred construction and its operation is provided on pages 2 and 3 in the "Background" section of the specification. Specifically, it is noted on page 2 of the specification that the basic EFPI sensor functions by providing and returning light through a fiber optic cable to a preferably small gap provided between and defined by two partially reflecting surfaces. Thus, the light returned from the partially reflected surfaces will have two components: one slightly delayed with respect to the other by the longer path back and forth across the gap and that the two light components will interfere with each other (e.g. where the light components wholly or partially reinforce or cancel each other and cause a readily observable interference pattern which will vary strongly with minute changes in the gap length).

Thus to sense any particular parameter of interest such as temperature or pressure or, in this case, flow

rate or shear force, it is only necessary to physically arrange the sensor in connection with other elements such that the parameter of interest will affect the length of the gap. The preferred arrangement for sensing flow rate and shear force is that which is disclosed in U. S. Patent 6,246,796 which is not only fully incorporated by reference but schematically illustrated in "Prior Art" Figure 1 and its basic construction and function described in detail on page 5 and in even greater detail on pages 8 - 10 of the original specification. Basically sensors are supported using a cantilever which is subject to the shear force of friction of a flow of fluid and, as the cantilever is deflected by the shear force or friction of fluid flow on a floating head, a force is applied to a fiber optic sensor which has a component in the direction of the axis of the sensor and thus causes increase or decrease of to the length of the gap of the fiber optic sensor. Therefore, enablement of those skilled in the art to practice the invention clearly is met in regard to the operation of the basic sensor and the use of such a sensor in a structure for measurement of fluid flow or shear force is clearly provided, contrary to the Examiner's assertions since the level of skill to which the enablement requirement is directed is at least as high as the level of enablement provided by U. S. Patent 6,246,796, incorporated by reference as well as the detailed summaries of the operation and construction of the basic EFPI sensor and a fluid flow or shear force sensor using the basic EFPI sensor provided in the present specification, as noted above.

It is noted on page 5 of the present specification that the fluid flow or shear force sensor described in the U.S. Patent 6,246,796 is compensated for changes in temperature but not pressure. It is the additional compensation for pressure consistent with temperature

compensation to which the present invention is directed. This additional property of the sensor in accordance with the invention is achieved by providing an arbitrarily high degree of self-compensation for temperature by providing a matching of CTEs of the sensor (particularly the housing tube) and the cantilever and then compensating for changes in dimensions due to pressure by common mode rejection of measured gap length changes since the gap length changes due to pressure changes (and any temperature change which is not self-compensated) will cause the same change in each of a plurality of fiber optic sensors whereas, changes of gap length which differ between sensors will be entirely due to the shear force or fluid flow friction which is the parameter of interest. The construction and operation of a sensor functioning in this manner and exhibiting substantially full compensation for pressure variation is detailed at pages 10 - 12 of the present specification.

Therefore, it is respectfully submitted that the Examiner is clearly in error in regard to enablement in regard to the issues raised by the Examiner which refers to the principles of operation as a very basic level well below the level of skill to which 35 U.S.C. §112, first paragraph, is directed and which are demonstrably met by virtue of the incorporation by reference of U. S. Patent 6,246,796 as well as the summaries of the operation and construction of the basic sensor and the flow rate or shear force sensor in the present application. While the Examiner does not question the enablement of the engendering of pressure insensitivity or compensation, it is evident that this additional disclosure on pages 10 - 12, clearly provides enablement of developing the additional sensor property for persons having the level of ordinary skill in the art commensurate with the patent incorporated by reference.

Accordingly, it is respectfully submitted that this ground of rejection is clearly in error substantively, reveals a lack of understanding of principles well-recognized in the art and a lack or consideration of the subject matter actually disclosed by the Examiner. The lack of understanding of basic and well-recognized principles of operation of fiber optic sensors is also respectfully submitted to be underscored by the citation (but not application against the claims) of prior art as being relevant which does not even involve fiber optic sensors. Therefore, reconsideration and withdrawal of this ground of rejection is respectfully requested.

Claims 1 - 15 have also been rejected under 35 U.S.C. §112, second paragraph, as being indefinite; the Examiner opining that the claims fail to recite essential or critical elements or devices. This ground of rejection is also respectfully traversed. Even the most cursory review of independent claims 1 and 15 reveals that a complete listing of elements and their cooperation for each of a plurality of basic sensors (lines 11 - 17 of claim 1 and lines 13 - 19 of claim 17) and the arrangement for adapting them to be responsive to fluid flow friction or shear forces (lines 3 - 9 of claim 1 and lines 5 - 11 or claim 15) is provided. The development of pressure insensitivity is supported in claims 1 and 15 by the recitation:

"a cantilever means extending between
said reference surface and said floating
head, and

"a plurality of integral fiber optic
sensors arranged to sense relative motion
between said reference surface and said
floating head"

since such structure is sufficient to provide a common mode response of the sensors to pressure and a differential mode response to fluid flow friction or

shear force and, in claim 15, the further recitation of:

"signal processing means including common mode signal rejection processing."

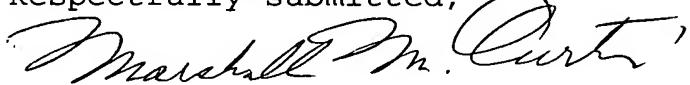
Therefore, the Examiner's assertions are clearly in error and further reflect the lack of understanding of the invention and a lack of proper consideration by the Examiner of the subject matter disclosed and claimed in the application.

Accordingly, it is respectfully submitted that this ground of rejection is similarly in error and untenable. Therefore, proper reconsideration and withdrawal thereof is respectfully requested.

Since all rejections, objections and requirements contained in the outstanding official action have been fully answered and shown to be in error and/or inapplicable to the present claims, it is respectfully submitted that reconsideration is now in order under the provisions of 37 C.F.R. §1.111(b) and such reconsideration is respectfully requested. Upon reconsideration, it is also respectfully submitted that this application is in condition for allowance and such action is therefore respectfully requested.

If an extension of time is required for this response to be considered as being timely filed, a conditional petition is hereby made for such extension of time. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-2041.

Respectfully submitted,



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